**APPENDIX C - ATTACHMENT A**

# Milo Gulch Hydrologic Analysis

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This memorandum describes the hydrologic analysis performed on the Milo Gulch area. The Guy Cave basin was subdivided into the following sub-basins: Raise 1 (A), Raise 2 (B), West Milo Diversion (C), and Surface Diversion (D). The Inez Shaft basin (E) was also modeled. Figure 1 shows the subbasin delineations.

## Summary of Hydrologic Analysis

Existing land use peak stormwater runoff rates were computed for the 2-, 10-, 25-, and 100 year, 24-hour design storms. Hydrologic analysis was performed using SCS methodology. Stormwater rates were calculated according to guidance found in the *Basis for Hydrologic Calculations for Gulches, Bunker Hill* (CH2M HILL, 1995). The hydrologic model HEC1 was used to compute flow rates.

The hydrologic model HEC1 simulates the rainfall-runoff process in a sub-basin. The model uses input data to calculate peak flow rates for different storm events. The input data in the HEC 1 model are sub-basin area, curve number (CN), a synthetic precipitation hytegraph, and time of concentration. The CN accounts for varying runoff characteristics due to various land types and is based on soil type and land use within the sub-basin. CN indirectly represents the amount of infiltration. A low CN represents low runoff and a high CN represents high runoff. A synthetic precipitation hytegraph is a plot of rainfall depth versus time for a given design storm event. Time of concentration is the time it takes for water to travel from the most remote location to the point of interest in the sub-basin. Time of concentration influences the shape and peak of the runoff hydrograph, for example, a low time of concentration represents low peak flow rates and a high time of concentration represents high peak flow rates.

Tables 1 through 4 show the precipitation input for events with and without snowmelt. The CN values represent existing land use conditions, and no attempt was made to predict future land use conditions. Table 5 shows the input and output of the hydrologic analysis. Appendix A shows supporting data. Sample input and output data for the 100 yr-24 hr storm event with and without snowmelt is provided in Appendix B.

## Additional Sources

The following sources were used to obtain input data:

*Milo Gulch Flood Hydrology and Water Quality Improvement Plan* (Spectrum Engineering, March 1996)

- CN for sub-basins B and C (labeled Guy Caves)
- Precipitation values for sub-basins A, B, C, and D (labeled Guy Caves)

*Bunker Creek and Government Gulch Flood Hydrology* (Bunker Creek Plan) (Spectrum Engineering, March 1996)

- CN for sub-basin E (labeled Upper Deadwood Gulch)
- Precipitation values for sub-basin E (labeled Upper Deadwood Gulch)



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